



Hamilton

CITY OF HAMILTON

**CITY MANAGER'S OFFICE
Audit Services Division**

TO: Chair and Members Audit, Finance and Administration Committee	WARD(S) AFFECTED: CITY WIDE
COMMITTEE DATE: March 19, 2012	
SUBJECT/REPORT NO: Audit Report 2011-09 - Information Services Software Asset Management (AUD12001) (City Wide)	
SUBMITTED BY: Ann Pekaruk Director, Audit Services City Manager's Office	PREPARED BY: Ann Pekaruk 905-546-2424 x4469
SIGNATURE:	

RECOMMENDATION

- (a) That Report AUD12001 respecting Audit Report 2011-09, Information Services Software Asset Management, be received;
- (b) That the Management Action Plans, as detailed in Appendix "A" of Report AUD12001 be approved; and
- (c) That the General Manager of Finance & Corporate Services be directed to instruct the appropriate staff to have the Management Action Plans (attached as Appendix "A" to Report AUD12001) be implemented.

EXECUTIVE SUMMARY

The 2011 Internal Audit work plan approved by Council included an audit of Information Services asset management. During the audit planning process, it was determined that, due to the pending contract award for desktop computers, it would be more practical and efficient to assess hardware asset management processes once the terms of the new contract had been finalized and these new assets had been deployed. Therefore, the scope of this audit was restricted to the management of software assets (including applications). Software asset management processes were assessed for strength of internal controls and effectiveness and efficiency of current asset management processes.

The results of the audit are presented in a formal Audit Report (2011-09) containing observations, recommendations and management responses. Audit Report 2011-09 is attached as Appendix “A” to Report AUD12001.

Alternatives for Consideration – See Page 3

FINANCIAL / STAFFING / LEGAL IMPLICATIONS (for Recommendation(s) only)

Financial: The implementation of several recommendations will be dependent on additional funding for a comprehensive asset management tool and for meeting requirements for PCI compliance.

Staffing: None.

Legal: Effective software licence management is necessary to ensure compliance with licence agreements or mitigate risk exposure to potential liability of lawsuits and/or fines.

HISTORICAL BACKGROUND (Chronology of events)

The audit was scheduled as part of the 2011 Internal Audit work plan approved by Council. Due to the anticipated upgrade of desktop computers and changes in the related asset management process, the scope of the original Information Services asset management audit was modified to restrict the 2011 audit scope to software assets (including applications). An audit of Information Services (IS) hardware assets was included in the 2012 Internal Audit work plan approved by Council.

The audit fieldwork was carried out and completed in October 2011. The results of this audit are attached as Appendix “A” of Report AUD12001.

The Audit, Finance and Administration Committee receives and approves final audit and review reports as part of its responsibilities for the oversight of governance and control.

POLICY IMPLICATIONS

Payment Card Industry Data Security Standard (PCI DSS)

RELEVANT CONSULTATION

Appendix “A” to Report AUD12001 includes management action plans which reflect the responses of management and staff in the Information Services Division, part of Corporate Services Department.

ANALYSIS / RATIONALE FOR RECOMMENDATION

(include Performance Measurement/Benchmarking Data, if applicable)

The audit assessed the management of software assets by the Information Services Division at the City of Hamilton. Audit objectives included evaluating the software asset management processes for their ability to ensure appropriate tracking and monitoring of assets, to ensure compliance with license agreements and to guide sound decision making. The compliance of practices with the Division's written procedures and the effectiveness and efficiency of current service delivery and internal controls were reviewed. Recommendations were made to management regarding opportunities for strengthening controls and improving operational efficiencies.

Using a three year average (2009-2011), annual spending on computer software is approximately \$3.2 million.

A formal Audit Report (2011-09) containing observations, recommendations and resulting management action plans was issued. Sixteen (16) recommendations were included in Audit Report 2011-09 (attached as Appendix "A" of Report AUD12001). Highlights of some of the recommendations made are as follows:

- Perform a risk assessment for software asset management processes.
- Establish and implement a strategy for the effective management of software assets.
- Document business policies and procedures in order to address and define key processes for the management of software assets.
- Assign responsibility and accountability for all software assets and IS related staff to the IS Division.
- Restrict the granting of administrative rights to staff across the City.
- Prohibit the development or purchase of new software (including applications) assets without the involvement of the IS Division.
- Monitor the compliance of software on City computers with license agreements and PCI Standards.
- Evaluate and report upon the effectiveness of software asset management processes using key performance measures.

Management and staff agreed with all the recommendations. Specific action plans can be found in the attached Audit Report. The implementation of some of the recommendations is dependent on funding for the proper management tools and the results of the IS Governance Review.

ALTERNATIVES FOR CONSIDERATION

(include Financial, Staffing, Legal and Policy Implications and pros and cons for each alternative)

Council could choose to not approve any of the recommendations in the Audit Report (2011-09) and accept the current state of software asset management. However, this non-action would result in the continuation of insufficient controls over software assets. Considering the resources that are currently invested in this function and the importance of technology in every aspect of the City's operations and provision of services, this alternative is not recommended.

CORPORATE STRATEGIC PLAN (Linkage to Desired End Results)

Focus Areas: 1. Skilled, Innovative and Respectful Organization, 2. Financial Sustainability, 3. Intergovernmental Relationships, 4. Growing Our Economy, 5. Social Development, 6. Environmental Stewardship, 7. Healthy Community

Financial Sustainability

- ♦ Delivery of municipal services and management of capital assets/liabilities in a sustainable, innovative and cost effective manner.

APPENDICES / SCHEDULES

Appendix "A" to Report AUD12001: Audit Report 2011-09

ap:bm

**CITY OF HAMILTON
INTERNAL AUDIT REPORT 2011-09
CORPORATE SERVICES – INFORMATION SERVICES
SOFTWARE ASSET MANAGEMENT**

#	OBSERVATIONS OF EXISTING SYSTEM	RECOMMENDATION FOR STRENGTHENING SYSTEM	MANAGEMENT ACTION PLAN
1.	<p><u>Risk Assessment for Software Asset Management</u></p> <p>A risk assessment to determine key risk areas for the management of software assets has not occurred.</p> <p>Risks need to be assessed to ensure processes can be implemented to eliminate or reduce critical high risks related to software assets and to prioritize the issues identified in this report.</p>	<p>That a risk assessment of the software asset management processes be performed.</p>	<p>Agreed. In 2006, Information Services (IS) spent \$50,000 and hired FlexiTY Solutions to complete a Business Impact Assessment for all applications and summarize the high level risks. IS will categorize software assets into high, medium and low risk. Estimated completion: Q4, 2012.</p>
2.	<p><u>Software Asset Management Plan and System</u></p> <p>A software asset management plan or strategy currently does not exist.</p> <p>There is no asset management system in use by the Information Services (IS) Division to manage all software assets at the organizational-wide level.</p> <p>This exposes the City to the risk that the organization is not being cost effective with approximately \$3 million of annual corporate software spending.</p>	<p>That the IS Division develop and implement a plan for the effective management of software assets that is reviewed and updated annually to reflect changes in the City's software asset management requirements. This should be done in conjunction with the risk assessment recommended in #1 above.</p> <p>That the implementation of a comprehensive asset management tool (that has automatic detection capabilities) be considered by the IS Division as part of the plan.</p>	<p>Agreed. IS currently has a software tool called SMS that captures all executable files. However, it does not easily identify software without significant manual effort. IS will include the cost for a comprehensive asset management tool (with automatic detection capabilities) in the IS 2013 Capital Budget submission (once it is approved).</p> <p>Agreed. IS expects that the full implementation of a comprehensive asset management tool would require 12 months to complete after selection and purchasing the tool. Estimated completion: Q4, 2014.</p>

**CORPORATE SERVICES – INFORMATION SERVICES
SOFTWARE ASSET MANAGEMENT
NOVEMBER 2011**

#	OBSERVATIONS OF EXISTING SYSTEM	RECOMMENDATION FOR STRENGTHENING SYSTEM	MANAGEMENT ACTION PLAN
3.	<p><u>Policy & Procedures</u> There are no business policies and procedures for the management of software assets.</p> <p>Without defined business policies and procedures, it is difficult for management to be held accountable for purchases and maintenance of software assets.</p>	<p>That business policies and procedures be written, implemented and distributed to staff in order to address and define key processes in the management of software assets.</p>	<p>Agreed. The policies and procedures will be developed by Q4, 2012 for desktop software assets. This will include all software that is included in the standard image such as MS Office, Windows and MacAfee. These policies and procedures will then be reviewed to see if they can be leveraged to include other software assets, specifically non-desktop software. Estimated completion: Q4, 2013.</p>

**CORPORATE SERVICES – INFORMATION SERVICES
SOFTWARE ASSET MANAGEMENT
NOVEMBER 2011**

#	OBSERVATIONS OF EXISTING SYSTEM	RECOMMENDATION FOR STRENGTHENING SYSTEM	MANAGEMENT ACTION PLAN
4.	<p><u>Single Point of Authority for Management of Software Assets</u></p> <p>Information technology is essential to operations throughout the organization, regardless of department, division or program.</p> <p>There is currently no single point of authority to ensure that a co-ordinated and standardized City-wide program exists for the management of software assets.</p> <p>Divisions at the City have the ability to purchase and develop software without consultation with or the involvement of the IS Division. There is no requirement in the current purchasing policy for the IS Division to be involved in software purchases and development.</p>	<p>That the responsibility and accountability for the management of all software assets be centralized in the IS Division.</p> <p>That the IS Division request a revision to the Corporate Purchasing Policy to require the IS Division's involvement and approval for software purchases.</p> <p>That other divisions be prohibited from developing and maintaining any new software (including applications) assets without the involvement of the IS Division.</p>	<p>Agreed. Currently, management of all software assets is not within IS's scope of responsibilities. However, this recommendation will be considered as part of the IS Governance Review included in the 2011 SMT Work Plan under Service Delivery Review. SMT will develop an IS governance model and identify areas for improvement, consolidation and savings (e.g. investigate rationalization of systems and improve internal processes). Estimated completion: Q1, 2013.</p> <p>Agreed. IS will request a revision to modify the Corporate Purchasing Policy. Estimated completion: Q2, 2012.</p> <p>Agreed. Once the Policy is modified and approved, IS will work with Procurement to communicate the changes to the City departments and SMT. Estimated completion: Q2, 2012.</p>

**CORPORATE SERVICES – INFORMATION SERVICES
SOFTWARE ASSET MANAGEMENT
NOVEMBER 2011**

#	OBSERVATIONS OF EXISTING SYSTEM	RECOMMENDATION FOR STRENGTHENING SYSTEM	MANAGEMENT ACTION PLAN
4.	<p><u>Single Point of Authority for Management of Software Assets (Cont'd.)</u></p> <p>A large number of software assets (applications, in particular) are not managed by the IS Division. Examples include the Hansen (Public Works) and Amanda (Planning and Economic Development) applications. They are maintained and supported by non-IS divisions who hire their own IS staff. However, the IS Division maintains the databases that are utilized by these applications.</p> <p>The total volume and scope of software (including applications) managed by divisions outside of the IS Division is currently unknown and the maintenance of software assets is fragmented across the organization.</p> <p>Inefficient spending on software assets may result due to the fact that many different divisions are doing separate purchasing. There is an increased risk of rogue applications and hardware with non-supported software. The collection and maintenance of corporate data with a high level of integrity does not occur because not all applications are supported by the IS Division.</p>	<p>That IS staff currently working in other departments report directly to management in the IS Division.</p>	<p>Agreed. This issue will be addressed by SMT and is identified in the 2011 SMT Work Plan under Service Delivery where SMT will develop an IS governance model. Estimated completion: Q1, 2013.</p>

**CORPORATE SERVICES – INFORMATION SERVICES
SOFTWARE ASSET MANAGEMENT
NOVEMBER 2011**

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5.	<p><u>Software Downloads (Administrative Rights)</u></p> <p>All staff with approved access to a desktop computer have the capability to install unlicensed software onto their assigned machines.</p> <p>The risk is that unauthorized software can be downloaded on City-owned computers. This rogue software could compromise the City's information network, resulting in a system failure that leads to lost productivity.</p>	<p>That a business process be developed granting administrative rights to specific staff in the IS Division.</p> <p>That all computers be configured to prevent the download/installation of any software by staff other than those that work in the IS Division.</p>	<p>Agreed. Only those resources that require administrative access will have such access. Where possible, the process will restrict access to staff that work in the IS Division. However, IS expects that there will be a requirement for some limited department resources to obtain administrative access. IS will authorize the individuals that need this type of access within the departments. Estimated completion: Q4, 2012.</p> <p>Agreed. IS will lockdown all desktops as part of the desktop rollout program. This lockdown will not allow staff to install software. Estimated completion: Q4, 2012.</p>

**CORPORATE SERVICES – INFORMATION SERVICES
SOFTWARE ASSET MANAGEMENT
NOVEMBER 2011**

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6.	<p><u>Monitoring of Software Compliance</u> There is very limited monitoring to ensure valid licences exist for the software downloaded on City computers. It is not known if the City is in compliance with software licence agreements, resulting in exposure to potential liability (i.e. fines).</p> <p>Further, monitoring desktop configurations for unsupported and/or unauthorized software is a requirement of PCI (Payment Card Industry) Standards. The City is required to be compliant with these standards in order to be able to accept credit card payments.</p>	<p>That the IS Division verify and continue to monitor the compliance of software on City computers with the respective licence agreements. Any non-compliance should be rectified to ensure software complies with licence agreements and with PCI Standards.</p>	<p>Agreed. The new process for locking down of desktops will prevent staff from installing software without going through the IS Change Management Procedure. Estimated completion: Q4, 2012.</p> <p>IS will include the cost for the appropriate monitoring tool in the 2013 Capital Budget submission. With approval, IS expects that this would be complete when the comprehensive asset management tool (addressed in #2 above) is fully implemented.</p>
7.	<p><u>Reconciliation of Software Licence Purchases</u> Purchased software licences are not reconciled against actual deployment on computers. The City does not know if it is over or under purchasing software licences.</p> <p>The risk exists that if the City is over-purchasing, too much money is being spent on software licences. If the City is under-purchasing, the City is exposed to the risk of lawsuits and/or potential fines.</p>	<p>That a process for reconciling software licence purchases against actual computer deployment be developed and implemented by the IS Division. Any issues with over or under purchasing that are identified in the reconciliation process should be resolved by the IS Division.</p>	<p>Agreed. The Computer Acceptable Use Policy must be complied with by all staff. It clearly indicates that all software installed on a City computer must be licensed.</p> <p>The new process for the locking down of desktops will prevent staff from installing software without going through the IS Change Management Procedure. Software that is licensed for servers is reconciled.</p>

**CORPORATE SERVICES – INFORMATION SERVICES
SOFTWARE ASSET MANAGEMENT
NOVEMBER 2011**

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8.	<p><u>Tracking of Software Assets</u> Any tracking of software assets (which is minimal) is currently performed by user, not by hardware items.</p> <p>Tracking software by user makes it difficult to ensure there is a proper number of licences and to detect unauthorized software downloads with automated detection tools.</p>	<p>That software assets be tracked by hardware (asset tags) instead of by users, where applicable.</p>	<p>Agreed. This information will be tracked in the Software Asset Management Tool referenced in #2 above. The asset management tool will be enhanced to capture information with respect to the license agreement and type.</p>
9.	<p><u>Inaccurate/Incomplete Software Inventories</u> In IS, there is a listing of known inventories of applications and related databases and desktop software. The IS Division estimates that this software inventory listing is only 60% accurate.</p> <p>In addition, as noted in observation #5, there may be further software on the City's computers of which IS is not even aware and thus, does not appear on the listing.</p> <p>Without complete and accurate inventory records, it is unlikely that effective management of software assets can occur.</p>	<p>That the IS Division develop a complete and accurate inventory of all software on City computers and keep it up to date.</p>	<p>Agreed. The current list will be reviewed and updated for improved accuracy. This list will focus on applications that have a medium to high business assessment impact. The inventory of all software that has a medium to high business assessment impact will be completed by Q1, 2013 and the supporting business processes to keep it accurate will be completed by Q2, 2013.</p>

**CORPORATE SERVICES – INFORMATION SERVICES
SOFTWARE ASSET MANAGEMENT
NOVEMBER 2011**

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10.	<p><u>Lack of Contracts</u></p> <p>During the audit, contract management staff the IS Division provided only one contract for software assets in their possession even though there are additional software contracts currently in effect throughout the City.</p> <p>This exposes the City to the risk of not being cost-effective with approximately \$3 million of corporate spending annually on software (including annual licence and maintenance fees).</p>	<p>That, going forward, contract management staff in the IS Division manage all corporate contracts for the software installed on City computers. Annual maintenance fees should also be included in order to take advantage of possible cost efficiencies.</p>	<p>Agreed. A new section was established in the IS Division for contract management. It focuses on major IS contracts for cellular, printers and desktops. Moving forward, this section will manage all corporate contracts that the IS Division is responsible for. The following is a list of some of the corporate contracts in the IS repository: Microsoft (Office, Windows Desktop, SCCM, CAL's, SQL Server Windows Server); PeopleSoft; Oracle; Adobe; Cisco UCSS_ESW Software Maintenance (IP telephony system); Intergraph (Geomedia, Trackforce); McAfee (Anti-virus); Avotus (IPT Call monitoring and billing software); Blackberry (BES); Inova (voice recording software); Citrix (remote access software); Symantec (security monitoring software); Crystal Enterprise (reporting software); and PCSD Globalscan (print management software).</p> <p>It is currently not part of the mandate of IS to manage contracts for all software. Contracts for departmental applications are managed by the departments. However, the IS Governance Review (noted in #4) will consider the role of contract management. Estimated completion: Q1, 2013.</p>

**CORPORATE SERVICES – INFORMATION SERVICES
SOFTWARE ASSET MANAGEMENT
NOVEMBER 2011**

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11.	<p><u>Performance Measurement</u></p> <p>Software asset management is not currently measured in terms of success or failure. Key deliverables have not been identified.</p> <p>Without defined measures for success, it is unknown how well software assets are being managed at the City.</p>	<p>That key performance measures (metrics) for the management of software assets be defined. These performance measures should be reported to the Senior Management Team (SMT) and Council on a regular basis.</p>	<p>Agreed. Key performance measures for software asset management will be defined by Q4, 2012. IS will commence reporting on those metrics to SMT by Q4, 2013.</p>